

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

Perfluorocarbon (PFC) Analysis

Lot #: D0A220629

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Case Narrative

D0A220629

TestAmerica Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the methods summary page in accordance with the methods indicated. Dilution factors and footnotes are provided on each datasheet to assist in the interpretation of the results.

The results relate only to the samples in this report and meet all requirements of NELAC. All data have been reviewed for compliance with the laboratory QA/QC plan and have found to be compliant with laboratory protocols with any exceptions noted below.

Please note that Non-Detect (ND) results have been evaluated down to the Method Detection Limit (MDL) and should be considered ND at the MDL. Unless otherwise noted, results for solids have been dry weight corrected.

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Sample Arrival and Receipt

The following report contains the analytical results for four samples received at TestAmerica Denver on January 22, 2010, according to documented sample acceptance procedures. The samples were received in good condition at a temperature of 3.7°C. No anomalies were encountered during sample receipt.

Standards

Analytical standards were prepared using commercially available certified solutions containing all compounds of interest.

The mass labeled compounds 13C4 PFBA, 13C2 PFHxA, 18O2 PFHxS, 13C4 PFOA, 13C4 PFOS, 13C5 PFNA, 13C2 PFDA, 13C2 PFUnA, 13C2 PFDoA, and D3 MeFOSA were introduced at the extraction step and were used for internal standards for the quantitation of the target compounds.

Sample Extraction and Analysis

The samples presented in this report were extracted for the target analytes by TestAmerica Denver's Standard Operating Procedure (SOP) DV-OP-0019 and analyzed for the target analytes by TestAmerica Denver's SOP DV-LC-0012.

Method QC Samples

The Method Blank is processed reagent water spiked with internal standard and prepared with each batch of 20 samples of the same matrix. The method blanks were non-detect at the reporting limits for the target analytes.

Each batch is prepared with mid level Laboratory Control Samples (LCS). The LCS recoveries were within established control limits, with the exception of the items noted in section Analytical Comments. The low-level LCS requirement changed on January 26, 2010.

Analytical Comments

The Standard Operating Procedure (SOP) was altered slightly in the sample preparation for FOSA. Sodium hydroxide was added to all four samples to obtain a pH of >12 instead of the SOP required <2. The basic pH is generating better internal standard recoveries for MeFOSA.

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the method. Due to high concentrations of target analytes, sample Confluent had to be analyzed at a dilution. The reporting limits have been adjusted relative to the dilution required.

Due to high percent recoveries in the mid-level LCS/LCSD associated with batch 0025466, all four samples were re-extracted out of the laboratory prescribed hold time and reanalyzed in QC batches 0032537 and 0034123. All three batches have been included in this report. There is no prescribed regulatory holding time requirement for PFCs. The scientific literature indicates PFCs are highly persistent compounds in the environment. TestAmerica Denver has conducted stability studies indicating medium- and low-level standard solutions of PFOA are stable for at least three months in glass, polystyrene, and polypropylene plastics at 4 ± 2 °C. The 7-day/40-day and 14-day/40-day holding times listed above are based on the general EPA convention for the holding time of extractable organic compounds in water and soil. Please note the sample results should be considered estimated.

The internal standard recovery for 13C2 PFDA associated with QC batch 0032537 was recovered below 50% in sample Fox. This is the second extraction of this sample and the sample was reanalyzed with similar results; therefore, corrective action is deemed unnecessary.

On January 26, 2010, the extraction Standard Operating Procedure (SOP) DV-OP-0019 was revised to remove the requirement for a low-level LCS. This means batches 0025463, 0025466, 0032537, and 0034123 only had a mid-level LCS or mid-level LCS/LCSD.

The mid-level LCS/LCSD associated with QC batch 0025466 exhibited percent recoveries above the QC control limits for several compounds. This is an indicator that data may be biased high. Upon re-extraction and reanalysis in QC batches 0032537 and 0034123, percent recoveries were 100% in control. All three sets of data have been provided, as re-extraction was unavoidably performed outside the laboratory recommended sample holding time.

The method required MS/MSD could not be performed for QC batches 0025463, 0025466, 0032537, due to insufficient sample volume. Method precision and accuracy have been verified by the acceptable mid-level LCS/LCSD analyses data.

Percent recoveries and RPD data could not be calculated for the laboratory generated MS/MSD associated with QC batch 0034123, because the sample was diluted beyond the ability to quantitate recoveries. The acceptable mid-level LCS analysis data indicated the analytical system was operating within control.

The Standard Operating Procedure (SOP) was altered slightly for these samples in the sample prep and LC conditions. The alterations are listed below.

Solvents are now the same as they were in the original SOP and run per the following gradient: From 0 to 11 minutes, the flow rate is 0.4 mL/minute and the MeOH ramps up from 25% to 100%. From 11 to 11.01 minutes, the flow rate increases to 0.7 mL/minute and this flow is diverted from the MS. At 13 minutes the flow rate decreases back down to 0.4 mL/minute and 25% MeOH. The column then equilibrates to 14 minutes.

PFTriA and PFTeA now use 13C2 PFUnA as their internal standard instead of 13C2 PFDoA.

No other anomalies were observed.

EXECUTIVE SUMMARY - Detection Highlights

DOA220629

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
TILTON 01/21/10 09:04 001				
Perfluoroheptanoic acid (PFHpA)	0.050	0.030	ug/L	DEN -LC-0012
Perfluorononanoic acid (PFNA)	0.026 J	0.040	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.14	0.030	ug/L	DEN -LC-0012
Perfluorohexane sulfonate (PFH)	0.029 J	0.030	ug/L	DEN -LC-0012
Perfluorobutanoic acid (PFBA)	0.054	0.020	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.090	0.020	ug/L	DEN -LC-0012
Perfluorodecanoic acid (PFDA)	0.036	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.21	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.31	0.030	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.16	0.020	ug/L	DEN -LC-0012
Perfluoroheptanoic acid (PFHpA)	0.051	0.030	ug/L	DEN -LC-0012
Perfluorononanoic acid (PFNA)	0.029 J	0.040	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.12	0.030	ug/L	DEN -LC-0012
Perfluorohexane sulfonate (PFH)	0.029 J	0.030	ug/L	DEN -LC-0012
Perfluorobutanoic acid (PFBA)	0.048	0.020	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.082	0.020	ug/L	DEN -LC-0012
Perfluorodecanoic acid (PFDA)	0.042	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.21	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.36	0.030	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.15	0.020	ug/L	DEN -LC-0012
Perfluorooctane sulfonamide (F)	0.040 J	0.050	ug/L	DEN -LC-0012
FOX 01/21/10 09:34 002				
Perfluoropentanoic acid (PFPA)	0.029 J	0.030	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.016 J	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.0087 J	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.016 J	0.030	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.019 J	0.020	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.017 J	0.030	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.014 J	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.0091 J	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.018 J	0.030	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.018 J	0.020	ug/L	DEN -LC-0012
BROWNS 01/21/10 09:48 003				
Perfluoropentanoic acid (PFPA)	0.012 J	0.030	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.0080 J	0.020	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.0093 J	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.026 J	0.030	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.015 J	0.020	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.0065 J	0.020	ug/L	DEN -LC-0012

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

DOA220629

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
BROWNS 01/21/10 09:48 003				
Perfluorobutane sulfonate (PFB)	0.010 J	0.020	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.019 J	0.030	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.013 J	0.020	ug/L	DEN -LC-0012
CONFLUENT 01/21/10 10:25 004				
Perfluoroheptanoic acid (PFHpA)	0.090 J	0.15	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.24	0.15	ug/L	DEN -LC-0012
Perfluorohexane sulfonate (PFH)	0.047 J	0.15	ug/L	DEN -LC-0012
Perfluorobutanoic acid (PFBA)	0.11	0.10	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.15	0.10	ug/L	DEN -LC-0012
Perfluorodecanoic acid (PFDA)	0.067 J	0.10	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.47	0.10	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.59	0.15	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.26	0.10	ug/L	DEN -LC-0012
Perfluoropentanoic acid (PFPA)	0.17 J	0.30	ug/L	DEN -LC-0012
Perfluorobutanoic acid (PFBA)	0.11 J	0.20	ug/L	DEN -LC-0012
Perfluorohexanoic acid (PFHxA)	0.13 J	0.20	ug/L	DEN -LC-0012
Perfluorobutane sulfonate (PFB)	0.47	0.20	ug/L	DEN -LC-0012
Perfluorooctanesulfonate	0.56	0.30	ug/L	DEN -LC-0012
Perfluorooctanoic Acid	0.25	0.20	ug/L	DEN -LC-0012
Perfluorooctane sulfonamide (F)	0.11	0.050	ug/L	DEN -LC-0012

METHODS SUMMARY

DOA220629

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
LC/MS/MS PFCs	DEN -LC-0012	SW846 FOSA spec

References:

DEN TestAmerica Laboratores, Denver, Facility Standard Operating Procedure.

METHOD / ANALYST SUMMARY

DOA220629

<u>ANALYTICAL METHOD</u>	<u>ANALYST</u>	<u>ANALYST ID</u>
DEN -LC-0012	Teresa L. Williams	002510

References:

DEN TestAmerica Laboratores, Denver, Facility Standard
Operating Procedure.

SAMPLE SUMMARY

D0A220629

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLED DATE</u>	<u>SAMP TIME</u>
LTMRQ	001	TILTON	01/21/10	09:04
LTMRV	002	FOX	01/21/10	09:34
LTMRW	003	BROWNS	01/21/10	09:48
LTMRX	004	CONFLUENT	01/21/10	10:25

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Dalton Utilities

Client Sample ID: TILTON

HPLC

Lot-Sample #....: DOA220629-001 Work Order #....: LTMRQ1AA Matrix.....: WATER
 Date Sampled....: 01/21/10 09:04 Date Received...: 01/22/10
 Prep Date.....: 01/25/10 Analysis Date...: 02/02/10
 Prep Batch #....: 0025466 Analysis Time...: 10:12
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluoroheptanoic acid (PFHpA)	0.050	0.030	ug/L	0.013
Perfluorononanoic acid (PFNA)	0.026 J	0.040	ug/L	0.017
Perfluorododecanoic acid (PFDo A)	ND	0.030	ug/L	0.015
Perfluorotridecanoic acid (PFT ria)	ND	0.040	ug/L	0.018
Perfluorotetradecanoic acid (P FTeA)	ND	0.030	ug/L	0.015
Perfluoropentanoic acid (PFPA)	0.14	0.030	ug/L	0.011
Perfluorohexane sulfonate (PFH xS)	0.029 J	0.030	ug/L	0.0070
Perfluorobutanoic acid (PFBA)	0.054	0.020	ug/L	0.0098
Perfluorohexanoic acid (PFHxA)	0.090	0.020	ug/L	0.0029
Perfluorodecanoic acid (PFDA)	0.036	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUn A)	ND	0.020	ug/L	0.0069
Perfluorobutane sulfonate (PFB S)	0.21	0.020	ug/L	0.0082
Perfluorooctanesulfonate	0.31	0.030	ug/L	0.013
Perfluorooctanoic Acid	0.16	0.020	ug/L	0.0098

SURROGATE	PERCENT RECOVERY	RECOVERY
		LIMITS
13C4 PFOA	122	(60 - 155)
13C4 PFOS	93	(45 - 130)
13C4 PFBA	108	(36 - 130)
13C2 PFHxA	105	(55 - 135)
18O2 PFHxS	113	(61 - 130)
13C5 PFNA	108	(54 - 132)
13C2 PFDA	91	(53 - 130)
13C2 PFUnA	76	(37 - 130)
13C2 PFDoA	70	(26 - 130)

NOTE (S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: TILTON

HPLC

Lot-Sample #....: D0A220629-001 Work Order #....: LTMRQ1AC Matrix.....: WATER
Date Sampled....: 01/21/10 09:04 Date Received...: 01/22/10
Prep Date.....: 01/25/10 Analysis Date...: 02/04/10
Prep Batch #....: 0025463 Analysis Time..: 18:07
Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorooctane sulfonamide (F OSA)	0.040 J	0.050	ug/L	0.0057

SURROGATE	PERCENT	RECOVERY	
		RECOVERY	LIMITS
MeFOSA	54	(37	- 130)

NOTE (S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: TILTON

HPLC

Lot-Sample #....: D0A220629-001 Work Order #....: LTMRQ2AA Matrix.....: WATER
 Date Sampled...: 01/21/10 09:04 Date Received...: 01/22/10
 Prep Date.....: 02/01/10 Analysis Date...: 02/02/10
 Prep Batch #....: 0032537 Analysis Time...: 23:52
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluoroheptanoic acid (PFHpA)	0.051	0.030	ug/L	0.013
Perfluorononanoic acid (PFNA)	0.029 J	0.040	ug/L	0.017
Perfluorododecanoic acid (PFDo A)	ND	0.030	ug/L	0.015
Perfluorotridecanoic acid (PFT ria)	ND	0.040	ug/L	0.018
Perfluorotetradecanoic acid (P FTeA)	ND	0.030	ug/L	0.015
Perfluoropentanoic acid (PFPA)	0.12	0.030	ug/L	0.011
Perfluorohexane sulfonate (PFH xS)	0.029 J	0.030	ug/L	0.0070
Perfluorobutanoic acid (PFBA)	0.048	0.020	ug/L	0.0098
Perfluorohexanoic acid (PFHxA)	0.082	0.020	ug/L	0.0029
Perfluorodecanoic acid (PFDA)	0.042	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUn A)	ND	0.020	ug/L	0.0069
Perfluorobutane sulfonate (PFB S)	0.21	0.020	ug/L	0.0082
Perfluorooctanesulfonate	0.36	0.030	ug/L	0.013
Perfluorooctanoic Acid	0.15	0.020	ug/L	0.0098

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	94	(60 - 155)
13C4 PFOS	61	(45 - 130)
13C4 PFBA	98	(36 - 130)
13C2 PFHxA	90	(55 - 135)
18O2 PFHxS	90	(61 - 130)
13C5 PFNA	77	(54 - 132)
13C2 PFDA	56	(53 - 130)
13C2 PFUnA	49	(37 - 130)
13C2 PFDoA	49	(26 - 130)

NOTE(S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: FOX

HPLC

Lot-Sample #....: D0A220629-002 Work Order #....: LTMRV1AA Matrix.....: WATER
 Date Sampled....: 01/21/10 09:34 Date Received...: 01/22/10
 Prep Date.....: 01/25/10 Analysis Date...: 02/02/10
 Prep Batch #....: 0025466 Analysis Time...: 10:42
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluoroheptanoic acid (PFHpA)	ND	0.030	ug/L	0.013
Perfluorononanoic acid (PFNA)	ND	0.040	ug/L	0.017
Perfluorododecanoic acid (PFDo A)	ND	0.030	ug/L	0.015
Perfluorotridecanoic acid (PFT riA)	ND	0.040	ug/L	0.018
Perfluorotetradecanoic acid (PFTeA)	ND	0.030	ug/L	0.015
Perfluoropentanoic acid (PFPA)	0.029 J	0.030	ug/L	0.011
Perfluorohexane sulfonate (PFH xS)	ND	0.030	ug/L	0.0070
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluorohexanoic acid (PFHxA)	0.016 J	0.020	ug/L	0.0029
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUn A)	ND	0.020	ug/L	0.0069
Perfluorobutane sulfonate (PFB S)	0.0087 J	0.020	ug/L	0.0082
Perfluorooctanesulfonate	0.016 J	0.030	ug/L	0.013
Perfluorooctanoic Acid	0.019 J	0.020	ug/L	0.0098

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	122	(60 - 155)
13C4 PFOS	84	(45 - 130)
13C4 PFBA	111	(36 - 130)
13C2 PFHxA	104	(55 - 135)
18O2 PFHxS	114	(61 - 130)
13C5 PFNA	105	(54 - 132)
13C2 PFDA	80	(53 - 130)
13C2 PFUnA	71	(37 - 130)
13C2 PFDoA	63	(26 - 130)

NOTE(S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: FOX

HPLC

Lot-Sample #....: D0A220629-002 Work Order #....: LTMRV1AC Matrix.....: WATER
Date Sampled...: 01/21/10 09:34 Date Received...: 01/22/10
Prep Date.....: 01/25/10 Analysis Date...: 02/04/10
Prep Batch #....: 0025463 Analysis Time...: 18:12
Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorooctane sulfonamide (F-OSA)	ND	0.050	ug/L	0.0057

SURROGATE	PERCENT	RECOVERY	
		RECOVERY	LIMITS
MeFOSA	55	(37 - 130)	

Dalton Utilities

Client Sample ID: FOX

HPLC

Lot-Sample #....: D0A220629-002 Work Order #....: LTMRV2AA Matrix.....: WATER
 Date Sampled....: 01/21/10 09:34 Date Received...: 01/22/10
 Prep Date.....: 02/01/10 Analysis Date...: 02/05/10
 Prep Batch #....: 0032537 Analysis Time...: 15:33
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluoroheptanoic acid (PFHpA)	ND	0.030	ug/L	0.013
Perfluorononanoic acid (PFNA)	ND	0.040	ug/L	0.017
Perfluorododecanoic acid (PFDo A)	ND	0.030	ug/L	0.015
Perfluorotridecanoic acid (PFT ria)	ND	0.040	ug/L	0.018
Perfluorotetradecanoic acid (P FTeA)	ND	0.030	ug/L	0.015
Perfluoropentanoic acid (PPPA)	0.017 J	0.030	ug/L	0.011
Perfluorohexane sulfonate (PFH xS)	ND	0.030	ug/L	0.0070
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluorohexanoic acid (PFHxA)	0.014 J	0.020	ug/L	0.0029
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUn A)	ND	0.020	ug/L	0.0069
Perfluorobutane sulfonate (PFB S)	0.0091 J	0.020	ug/L	0.0082
Perfluorooctanesulfonate	0.018 J	0.030	ug/L	0.013
Perfluorooctanoic Acid	0.018 J	0.020	ug/L	0.0098

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	74	(60 - 155)
13C4 PFOS	46	(45 - 130)
13C4 PFBA	74	(36 - 130)
13C2 PFHxA	69	(55 - 135)
18O2 PFHxS	68	(61 - 130)
13C5 PFNA	64	(54 - 132)
13C2 PFDA	43 *	(53 - 130)
13C2 PFUnA	37	(37 - 130)
13C2 PFDoA	32	(26 - 130)

NOTE (S) :

* Surrogate recovery is outside stated control limits.

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: BROWNS

HPLC

Lot-Sample #....: D0A220629-003 Work Order #....: LTMRW1AA Matrix.....: WATER
 Date Sampled....: 01/21/10 09:48 Date Received...: 01/22/10
 Prep Date.....: 01/25/10 Analysis Date...: 02/02/10
 Prep Batch #....: 0025466 Analysis Time...: 10:57
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluoroheptanoic acid (PFHpA)	ND	0.030	ug/L	0.013
Perfluorononanoic acid (PFNA)	ND	0.040	ug/L	0.017
Perfluorododecanoic acid (PFDo A)	ND	0.030	ug/L	0.015
Perfluorotridecanoic acid (PFT ria)	ND	0.040	ug/L	0.018
Perfluorotetradecanoic acid (P FTeA)	ND	0.030	ug/L	0.015
Perfluoropentanoic acid (PPFA)	0.012 J	0.030	ug/L	0.011
Perfluorohexane sulfonate (PFH xS)	ND	0.030	ug/L	0.0070
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluorohexanoic acid (PFHxA)	0.0080 J	0.020	ug/L	0.0029
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUn A)	ND	0.020	ug/L	0.0069
Perfluorobutane sulfonate (PFB S)	0.0093 J	0.020	ug/L	0.0082
Perfluorooctanesulfonate	0.026 J	0.030	ug/L	0.013
Perfluorooctanoic Acid	0.015 J	0.020	ug/L	0.0098

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	116	(60 - 155)
13C4 PFOS	65	(45 - 130)
13C4 PFBA	105	(36 - 130)
13C2 PFHxA	104	(55 - 135)
18O2 PFHxS	109	(61 - 130)
13C5 PFNA	95	(54 - 132)
13C2 PFDA	58	(53 - 130)
13C2 PFUnA	46	(37 - 130)
13C2 PFDoA	41	(26 - 130)

NOTE(S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: BROWNS

HPLC

Lot-Sample #....: D0A220629-003 Work Order #....: LTMRW1AC Matrix.....: WATER
Date Sampled....: 01/21/10 09:48 Date Received...: 01/22/10
Prep Date.....: 01/25/10 Analysis Date...: 02/04/10
Prep Batch #....: 0025463 Analysis Time...: 18:17
Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	REPORTING			
	RESULT	LIMIT	UNITS	MDL
Perfluorooctane sulfonamide (F OSA)	ND	0.050	ug/L	0.0057
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SURROGATE	PERCENT	RECOVERY	LIMITS	
MeFOSA	43	(37 - 130)		

Dalton Utilities

Client Sample ID: BROWNS

HPLC

Lot-Sample #....: D0A220629-003 Work Order #....: LTMRW2AA Matrix.....: WATER
 Date Sampled...: 01/21/10 09:48 Date Received...: 01/22/10
 Prep Date.....: 02/01/10 Analysis Date...: 02/03/10
 Prep Batch #....: 0032537 Analysis Time...: 00:22
 Dilution Factor: 1 Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluoroheptanoic acid (PFHpA)	ND	0.030	ug/L	0.013
Perfluorononanoic acid (PFNA)	ND	0.040	ug/L	0.017
Perfluorododecanoic acid (PFDo A)	ND	0.030	ug/L	0.015
Perfluorotridecanoic acid (PFT ria)	ND	0.040	ug/L	0.018
Perfluorotetradecanoic acid (P FTeA)	ND	0.030	ug/L	0.015
Perfluoropentanoic acid (PFPA)	ND	0.030	ug/L	0.011
Perfluorohexane sulfonate (PFH xS)	ND	0.030	ug/L	0.0070
Perfluorobutanoic acid (PFBA)	ND	0.020	ug/L	0.0098
Perfluorohexanoic acid (PFHxA)	0.0065 J	0.020	ug/L	0.0029
Perfluorodecanoic acid (PFDA)	ND	0.020	ug/L	0.0078
Perfluoroundecanoic acid (PFUn A)	ND	0.020	ug/L	0.0069
Perfluorobutane sulfonate (PFB S)	0.010 J	0.020	ug/L	0.0082
Perfluorooctanesulfonate	0.019 J	0.030	ug/L	0.013
Perfluorooctanoic Acid	0.013 J	0.020	ug/L	0.0098

SURROGATE	PERCENT RECOVERY	RECOVERY	
		LIMITS	
13C4 PFOA	103	(60	- 155)
13C4 PFOS	78	(45	- 130)
13C4 PFBA	100	(36	- 130)
13C2 PFHxA	94	(55	- 135)
18O2 PFHxS	96	(61	- 130)
13C5 PFNA	90	(54	- 132)
13C2 PFDA	74	(53	- 130)
13C2 PFUnA	64	(37	- 130)
13C2 PFDoA	59	(26	- 130)

NOTE(S):

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: CONFLUENT

HPLC

Lot-Sample #....: D0A220629-004 Work Order #....: LTMRX1AA Matrix.....: WATER
 Date Sampled....: 01/21/10 10:25 Date Received...: 01/22/10
 Prep Date.....: 01/25/10 Analysis Date...: 02/02/10
 Prep Batch #....: 0025466 Analysis Time...: 11:12
 Dilution Factor: 5

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorooctanoic acid (PFHpA)	0.090 J	0.15	ug/L	0.066
Perfluorononanoic acid (PFNA)	ND	0.20	ug/L	0.087
Perfluorododecanoic acid (PFDo A)	ND	0.15	ug/L	0.075
Perfluorotridecanoic acid (PFT ria)	ND	0.20	ug/L	0.089
Perfluorotetradecanoic acid (P FTeA)	ND	0.15	ug/L	0.073
Perfluoropentanoic acid (PFPA)	0.24	0.15	ug/L	0.055
Perfluorohexane sulfonate (PFH xS)	0.047 J	0.15	ug/L	0.035
Perfluorobutanoic acid (PFBA)	0.11	0.10	ug/L	0.049
Perfluorohexanoic acid (PFHxA)	0.15	0.10	ug/L	0.015
Perfluorodecanoic acid (PFDA)	0.067 J	0.10	ug/L	0.039
Perfluoroundecanoic acid (PFUn A)	ND	0.10	ug/L	0.034
Perfluorobutane sulfonate (PFB S)	0.47	0.10	ug/L	0.041
Perfluorooctanesulfonate	0.59	0.15	ug/L	0.067
Perfluorooctanoic Acid	0.26	0.10	ug/L	0.049

SURROGATE	PERCENT RECOVERY	RECOVERY	
		LIMITS	
13C4 PFOA	127	(60	- 155)
13C4 PFOS	122	(45	- 130)
13C4 PFBA	114	(36	- 130)
13C2 PFHxA	108	(55	- 135)
18O2 PFHxS	123	(61	- 130)
13C5 PFNA	126	(54	- 132)
13C2 PFDA	121	(53	- 130)
13C2 PFUnA	116	(37	- 130)
13C2 PFDoA	116	(26	- 130)

NOTE (S) :

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: CONFLUENT

HPLC

Lot-Sample #....: D0A220629-004 Work Order #....: LTMRX1AC Matrix.....: WATER
Date Sampled....: 01/21/10 10:25 Date Received...: 01/22/10
Prep Date.....: 01/25/10 Analysis Date...: 02/04/10
Prep Batch #....: 0025463 Analysis Time...: 18:22
Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluorooctane sulfonamide (F OSA)	0.11	0.050	ug/L	0.0057
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SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS		
MeFOSA	50	(37 - 130)		

Dalton Utilities

Client Sample ID: CONFLUENT

HPLC

Lot-Sample #....: D0A220629-004 Work Order #....: LTMRX2AA Matrix.....: WATER
 Date Sampled....: 01/21/10 10:25 Date Received...: 01/22/10
 Prep Date.....: 02/03/10 Analysis Date...: 02/05/10
 Prep Batch #....: 0034123 Analysis Time...: 06:18
 Dilution Factor: 10

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Perfluoroheptanoic acid (PFHpA)	ND	0.30	ug/L	0.13
Perfluorononanoic acid (PFNA)	ND	0.40	ug/L	0.17
Perfluorododecanoic acid (PFDo A)	ND	0.30	ug/L	0.15
Perfluorotridecanoic acid (PFT ria)	ND	0.40	ug/L	0.18
Perfluorotetradecanoic acid (PFTeA)	ND	0.30	ug/L	0.15
Perfluoropentanoic acid (PFPA)	0.17 J	0.30	ug/L	0.11
Perfluorohexane sulfonate (PFH xS)	ND	0.30	ug/L	0.070
Perfluorobutanoic acid (PFBA)	0.11 J	0.20	ug/L	0.098
Perfluorohexanoic acid (PFHxA)	0.13 J	0.20	ug/L	0.029
Perfluorodecanoic acid (PFDA)	ND	0.20	ug/L	0.078
Perfluoroundecanoic acid (PFUn A)	ND	0.20	ug/L	0.069
Perfluorobutane sulfonate (PFB S)	0.47	0.20	ug/L	0.082
Perfluorooctanesulfonate	0.56	0.30	ug/L	0.13
Perfluorooctanoic Acid	0.25	0.20	ug/L	0.098

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	102	(60 - 155)
13C4 PFOS	100	(45 - 130)
13C4 PFBA	106	(36 - 130)
13C2 PFHxA	103	(55 - 135)
18O2 PFHxS	97	(61 - 130)
13C5 PFNA	105	(54 - 132)
13C2 PFDA	105	(53 - 130)
13C2 PFUnA	104	(37 - 130)
13C2 PFDoA	105	(26 - 130)

NOTE (S) :

J Estimated result. Result is less than RL.